

WHAT IS CLAIMED IS:

1. A test system for a mobile communication terminal, comprising:

5 a test procedure control unit which possesses a procedure for carrying out a transition test of a connection state of a mobile communication terminal of a cellular system, and outputs control information including time setting information along the procedure;

10 a transmitting/receiving unit which, in accordance with the control information from the test procedure control unit, generates a plurality of test signals corresponding to a plurality of cells in the cellular system, varies said plurality of test signals so as to be successively stronger in accordance with a scheduled  
15 time-passage and transmits the signals toward the mobile communication terminal, and receives a response signal from the mobile communication terminal;

20 a reception measurement unit which measures a transition time of the connection state among the cells of the mobile communication terminal, the transition time being a time when the mobile communication terminal switches from a state of receiving one test signal among said plurality of test signals to a state of receiving another test signal, in accordance with  
25 the response signal from the mobile communication terminal;

a deciding unit which receives a measured result

of the transition time from the reception measurement unit, and decides whether or not the connection state of the mobile communication terminal is transiting among said plurality of cells in the cellular system in accordance with the scheduled time-passage;

an indicating unit which indicates results of the transition test of the connection state of the mobile communication terminal; and

an indication control unit which receives the decided result of the connection state from the deciding unit and the measured result of the transition time from the reception measurement unit, and causes the indicating unit to indicate, as a result of the transition test of the connection state of the mobile communication terminal, the decided result of the connection state and the transition among the cells of the connection state of the mobile communication terminal corresponding to the time-passage, so as to be visually recognizable on a single coordinate.

2. The test system for a mobile communication terminal according to claim 1, wherein the test system for a mobile communication terminal further comprises:

a statistical processing unit which determines a transition success rate showing establishment of successes in the transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to

the time-passage on the basis of the decided result of the connection state from the deciding unit, and

the indication control unit indicates the transition success rate showing the establishment of successes in transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-passage determined by the statistical processing unit, so as to be visually recognizable on the single coordinate.

3. The test system for a mobile communication terminal according to claim 1, wherein the indication control unit includes a coordinate generating unit which generates, as the single coordinate, a coordinate showing the time-passage corresponding to at least two cells, and indicates the coordinate on the indicating unit.

4. The test system for a mobile communication terminal according to claim 3, wherein the indication control unit includes a schedule-marker generating unit which generates a schedule-marker showing a schedule of transition among the cells of the connection state of the mobile communication terminal according to the scheduled time-passage, and indicates the schedule-marker in advance on the coordinate that shows the time-passage and that is displayed by the coordinate generating unit, in accordance with time setting

information from the test procedure control unit.

5. The test system for a mobile communication terminal according to claim 4, wherein the indication control unit includes a reception-marker generating unit which receives a decided result of the connection state from the deciding unit, generates a reception-marker showing the decided result that is obtained at every time when the connection state transits in accordance with the time-passage, and indicates the reception-marker, together with the schedule-marker generated by the schedule-marker generating unit, on the coordinate that shows the time-passage and that is displayed by the coordinate generating unit; and an indicating position of the reception-marker shows a current time.

6. The test system for a mobile communication terminal according to claim 5, wherein the schedule-marker generated by the schedule-marker generating unit is varied so as to be recognizable from the initial schedule marker in accordance with progress of the transition among the cells of the connection state of the mobile communication terminal.

7. The test system for a mobile communication terminal according to claim 5, wherein the reception-marker generated by the reception-marker generating unit includes a reception-marker relating to decided results of idling and registration of the mobile

communication terminal which are carried out prior to the transition among the cells of the connection state of the mobile communication terminal.

5        8. The test system for a mobile communication terminal according to claim 7, wherein the reception-markers generated by the reception-marker generating unit are varied such that a reception-marker showing the decided result in the past and a reception-marker showing the decided result at present can be recognized  
10      from one another.

9. The test system for a mobile communication terminal according to claim 1, wherein the test procedure control unit has a computer and computer readable program code means for causing the computer to  
15      carry out a transition test of a connection state of a mobile communication terminal of a cellular system, and outputs control information including time setting information along the computer readable program code means.

20      10. The test system for a mobile communication terminal according to claim 9, wherein the deciding unit and the indication control unit are constructed as software of the computer together with the test procedure control unit.

25      11. The test system for a mobile communication terminal according to claim 10, wherein the computer readable program code means comprises:

first computer readable program code means for,  
in accordance with the control information from  
the test procedure control unit, causing the  
transmitting/receiving unit to generate a plurality of  
5 test signals corresponding to a plurality of cells in  
the cellular system, to vary said plurality of test  
signals so as to be successively stronger in accordance  
with a scheduled time-passage and transmit the signals  
toward the mobile communication terminal, and to  
10 receive a response signal from the mobile communication  
terminal;

second computer readable program code means for  
causing the reception measurement unit to measure a  
transition time of the connection state among the cells  
15 of the mobile communication terminal, the transition  
time being a time when the mobile communication  
terminal switches from a state of receiving one test  
signal among the plurality of test signals to a state  
of receiving another test signal, in accordance with  
20 the response signal from the mobile communication  
terminal;

third computer readable program code means for  
causing the deciding unit to receive a measured result  
of the transition time from the reception measurement  
25 unit, and to decide whether or not the connection  
state of the mobile communication terminal is  
transiting among said plurality of cells in

the cellular system in accordance with the  
predetermined time-passage; and

fourth computer readable program code means for  
causing the indication control unit to receive a  
5 decided result of the connection state from the  
deciding unit and the measured result of the transition  
time from the reception measurement unit, and to  
control for causing the indicating unit to indicate, as  
a result of the transition test of the connection state  
10 of the mobile communication terminal, the decided  
result of the connection state and the transition among  
the cells of the connection state of the mobile  
communication terminal corresponding to the time-  
passage, so as to be visually recognizable on a single  
15 coordinate.

12. The test system for a mobile communication  
terminal according to claim 2, wherein the test  
procedure control unit has a computer and computer  
readable program code means for causing the computer to  
20 carry out a transition test of a connection state of a  
mobile communication terminal of a cellular system, and  
outputs control information including time setting  
information along the computer readable program code  
means,

25 the statistical processing unit is constructed as  
a software of the computer together with the deciding  
unit, the indication control unit, and the test

procedure control unit, and

the computer readable program code means  
comprises:

first computer readable program code means for  
5 causing the transmitting/receiving unit to generate a  
plurality of test signals corresponding to a plurality  
of cells in the cellular system in accordance with the  
control information from the test procedure control  
unit, to vary said plurality of test signals so as to  
10 be successively stronger in accordance with a scheduled  
time-passage and transmit the signals toward the mobile  
communication terminal, and to receive a response  
signal from the mobile communication terminal;

second computer readable program code means for  
15 causing the reception measurement unit to measure a  
transition time of the connection state among the cells  
of the mobile communication terminal, the transition  
time being a time when the mobile communication  
terminal switches from a state of receiving one test  
20 signal among the plurality of test signals to a state  
of receiving another test signal, in accordance with  
the response signal from the mobile communication  
terminal;

third computer readable program code means for  
25 causing the deciding unit to receive a measured result  
of the transition time from the reception measurement  
unit, and to decide whether or not the connection state



of the mobile communication terminal is transiting among said plurality of cells in the cellular system in accordance with the predetermined time-passage;

fourth computer readable program code means for  
5 causing the indication control unit to receive the decided result of the connection state from the deciding unit and receive the measured result of the transition time from the reception measurement unit, and to control for causing the indicating unit to  
10 indicate, as a result of the transition test of the connection state of the mobile communication terminal, the decided result of the connection state and the transition among the cells of the connection state of the mobile communication terminal corresponding to the  
15 time-passage, so as to be visually recognizable on a single coordinate;

fifth computer readable program code means for causing the statistical processing unit to determine a transition success rate showing establishment of  
20 successes in transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-passage on the basis of the decided result of the connection state from the deciding unit; and

25 sixth computer readable program code means for causing the indication control unit to carry out controls for indicating the transition success rate

showing the establishment of successes in transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-passage determined by the statistical processing unit, so as to be visually  
5 recognizable on the single coordinate.

13. A method for testing a mobile communication terminal, comprising:

preparing a test procedure control unit which  
10 possesses a procedure for carrying out a transition test of a connection state of a mobile communication terminal of a cellular system, and outputs control information including time setting information along the procedure;

15 in accordance with the control information from the test procedure control unit, generating a plurality of test signals corresponding to a plurality of cells in the cellular system, varying said plurality of test signals so as to be successively stronger in accordance with a scheduled time-passage and transmitting the  
20 signals toward the mobile communication terminal, and receiving a response signal from the mobile communication terminal;

measuring a transition time of the connection  
25 state among the cells of the mobile communication terminal, the transition time being a time when the mobile communication terminal switches from a state of

receiving one test signal among the plurality of test signals to a state of receiving another test signal, in accordance with the response signal from the mobile communication terminal;

5           receiving a measured result of the transition time, and deciding whether or not the connection state of the mobile communication terminal is transiting among said plurality of cells in the cellular system in accordance with the scheduled time-passage; and

10           receiving the decided result of the connection state and the measured result of the transition time, and causing the indicating unit to indicate, as a result of the transition test of the connection state of the mobile communication terminal, the decided  
15           result of the connection state and the transition among the cells of the connection state of the mobile communication terminal corresponding to the time-passage, so as to be visually recognizable on a single coordinate.

20           14. The method for testing a mobile communication terminal according to claim 13, wherein the method for testing a mobile communication terminal further comprises:

              determining a transition success rate showing  
25           establishment of successes in the transitions among the cells of the connection state of the mobile communication terminal for each time interval

corresponding to the time-passage on the basis of the decided result of the connection state; and

indicating the transition success rate showing the establishment of successes in transitions among the  
5 cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-passage, so as to be visually recognizable on the single coordinate.

15. A test system for a mobile communication  
10 terminal, comprising:

test procedure control means for possessing a procedure for carrying out a transition test of a connection state of a mobile communication terminal of a cellular system, and outputting control information  
15 including time setting information along the procedure;

transmitting/receiving means for, in accordance with the control information from the test procedure control means, generating a plurality of test signals corresponding to a plurality of cells in the cellular  
20 system, varying said plurality of test signals so as to be successively stronger in accordance with a scheduled time-passage and transmitting the signals toward the mobile communication terminal, and receiving a response signal from the mobile communication terminal;

25 reception measurement means for measuring a transition time of the connection state among the cells of the mobile communication terminal, the transition

time being a time when the mobile communication terminal switches from a state of receiving one test signal among said plurality of test signals to a state of receiving another test signal, in accordance with the response signal from the mobile communication terminal;

deciding means for receiving a measured result of the transition time from the reception measurement means, and deciding whether or not the connection state of the mobile communication terminal is transiting among said plurality of cells in the cellular system in accordance with the scheduled time-passage;

indicating means for indicating the result of the transition test of the connection state of the mobile communication terminal; and

indication control means for receiving the decided result of the connection state from the deciding means and the measured result of the transition time from the reception measurement means, and causing the indicating means indicate, as results of the transition test of the connection state of the mobile communication terminal, the decided result of the connection state and the transition among the cells of the connection state of the mobile communication terminal corresponding to the time-passage, so as to be visually recognizable on a single coordinate.

16. The test system for a mobile communication

terminal according to claim 15, wherein the test system for a mobile communication terminal further comprises:

5           statistical processing means for determining a transition success rate showing establishment of successes in the transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-passage on the basis of the decided result of the connection state from the deciding means, and

10           the indication control means indicates the transition success rate showing the establishment of successes in transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-

15           passage determined by the statistical processing means, so as to be visually recognizable on the single coordinate.

17. The test system for a mobile communication terminal according to claim 15, wherein the indication control means includes coordinate generating means for generating, as the single coordinate, a coordinate showing the time-passage corresponding to at least two cells, and indicating the coordinate on the indicating means.

25           18. The test system for a mobile communication terminal according to claim 17, wherein the indication control means includes schedule-marker generating means

for generating a schedule-marker showing a schedule of  
a transition among the cells of the connection state of  
the mobile communication terminal according to the  
scheduled time-passage, and indicating the schedule-  
5 marker in advance on the coordinate that shows the  
time-passage and that is displayed by the coordinate  
generating means, in accordance with time setting  
information from the test procedure control means.

19. The test system for a mobile communication  
10 terminal according to claim 18, wherein the indication  
control means includes reception-marker generating  
means for receiving a decided result of the connection  
state from the deciding means, generating a reception-  
marker showing the decided result that is obtained at  
15 every time when the connection state transits in  
accordance with the time-passage, and indicating the  
reception-marker, together with the schedule-marker  
generated by the schedule-marker generating means on  
the coordinate that shows the time-passage and that is  
20 displayed by the coordinate generating means; and  
an indicating position of the reception-marker shows  
a current time.

20. The test system for a mobile communication  
terminal according to claim 19, wherein the schedule-  
25 marker generated by the schedule-marker generating  
means is varied so as to be recognizable from the  
initial schedule marker in accordance with progress of

the transition among the cells of the connection state of the mobile communication terminal.

21. The test system for a mobile communication terminal according to claim 19, wherein the reception-  
5 marker generated by the reception-marker generating means includes a reception-marker relating to decided results of idling and registration of the mobile communication terminal which are carried out prior to the transition among the cells of the connection state  
10 of the mobile communication terminal.

22. The test system for a mobile communication terminal according to claim 21, wherein the reception-  
markers generated by the reception-marker generating means are varied such that a reception-marker showing  
15 the decided result in the past and a reception-marker showing the decided result at present can be recognized from one another.

23. The test system for a mobile communication terminal according to claim 15, wherein the test  
20 procedure control means has a computer and computer readable program code means for causing the computer to carry out a transition test of a connection state of a mobile communication terminal of a cellular system, and outputs control information including time setting  
25 information along the computer readable program code means.

24. The test system for a mobile communication



terminal according to claim 23, wherein the deciding means and the indication control means are constructed as software of the computer together with the test procedure control means.

5           25. The test system for a mobile communication terminal according to claim 24, wherein the computer readable program code means comprises:

          first computer readable program code means for,  
in accordance with the control information from  
10 the test procedure control means, causing the transmitting/receiving means to generate a plurality of test signals corresponding to a plurality of cells in the cellular system, to vary said plurality of test signals so as to be successively stronger in accordance  
15 with a scheduled time-passage and transmit the signals toward the mobile communication terminal, and to receive a response signal from the mobile communication terminal;

          second computer readable program code means for  
20 causing the reception measurement means to measure a transition time of the connection state among the cells of the mobile communication terminal, the transition time being a time when the mobile communication terminal switches from a state of receiving one test  
25 signal among said plurality of test signals to a state of receiving another test signal, in accordance with the response signal from the mobile communication

terminal;

third computer readable program code means for causing the deciding means to receive a measured result of the transition time from the reception measurement means, and to decide whether or not the connection state of the mobile communication terminal is transiting among said plurality of cells in the cellular system in accordance with the predetermined time-passage; and

fourth computer readable program code means for causing the indication control means to receive the decided result of the connection state from the deciding means and the measured result of the transition time from the reception measurement means, and to control for causing the indicating means to indicate, as results of the transition test of the connection state of the mobile communication terminal, the decided result of the connection state and the transition among the cells of the connection state of the mobile communication terminal corresponding to the time-passage, so as to be visually recognizable on a single coordinate.

26. The test system for a mobile communication terminal according to claim 16, wherein the test procedure control means has a computer and computer readable program code means for causing the computer to carry out a transition test of a connection state of

a mobile communication terminal of a cellular system,  
and outputs control information including time setting  
information along the computer readable program code  
means,

5           the statistical processing means is constructed as  
a software of the computer together with the deciding  
means, the indication control means, and the test  
procedure control means, and

          the computer readable program code means  
10   comprises:

          first computer readable program code means for,  
in accordance with the control information from  
the test procedure control means, causing the  
transmitting/receiving means to generate a plurality of  
15   test signals corresponding to a plurality of cells in  
the cellular system, to vary said plurality of test  
signals so as to be successively stronger in accordance  
with a scheduled time-passage and transmit the signals  
toward the mobile communication terminal, and to  
20   receive a response signal from the mobile communication  
terminal;

          second computer readable program code means for  
causing the reception measurement means to measure a  
transition time of the connection state among the cells  
25   of the mobile communication terminal, the transition  
time being a time when the mobile communication  
terminal switches from a state of receiving one test

signal among said plurality of test signals to a state of receiving another test signal, in accordance with the response signal from the mobile communication terminal;

5           third computer readable program code means for causing the deciding means to receive a measured result of the transition time from the reception measurement means, and to decide whether or not the connection state of the mobile communication terminal is  
10           transiting among said plurality of cells in the cellular system in accordance with the predetermined time-passage;

          fourth computer readable program code means for causing the indication control means to receive the  
15           decided result of the connection state from the deciding means and the measured result of the transition time from the reception measurement means, and to control for causing the indicating means to indicate, as results of the transition test of the  
20           connection state of the mobile communication terminal, the decided result of the connection state and the transition among the cells of the connection state of the mobile communication terminal corresponding to the time-passage, so as to be visually recognizable on  
25           a single coordinate;

          fifth computer readable program code means for causing the statistical processing means to determine

a transition success rate showing establishment of successes in transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-  
5 passage on the basis of the decided result of the connection state from the deciding means; and

sixth computer readable program code means for causing the indication control means to control for indicating the transition success rate showing the  
10 establishment of successes in transitions among the cells of the connection state of the mobile communication terminal for each time interval corresponding to the time-passage determined by the statistical processing means, so as to be visually  
15 recognizable on the single coordinate.